# Volunteer Lake Assessment Program Individual Lake Reports

## SKATUTAKEE, LAKE, HARRISVILLE, NH

**MORPHOMETRIC DATA**

| | | | | | |
|---|---|---|---|---|---|
| **Watershed Area (Ac.):** | 11,200 | **Max. Depth (m):** | 6.2 | **Flushing Rate (yr$^{-1}$):** | 8.3 |
| **Surface Area (Ac.):** | 261 | **Mean Depth (m):** | 2.9 | **P Retention Coef:** | 0.46 |
| **Shore Length (m):** | 6,100 | **Volume (m$^3$):** | 3,044,500 | **Elevation (ft):** | 1202 |

**TROPHIC CLASSIFICATION**

| Year | Trophic class |
|---|---|
| 1988 | MESOTROPHIC |
| 2006 | MESOTROPHIC |

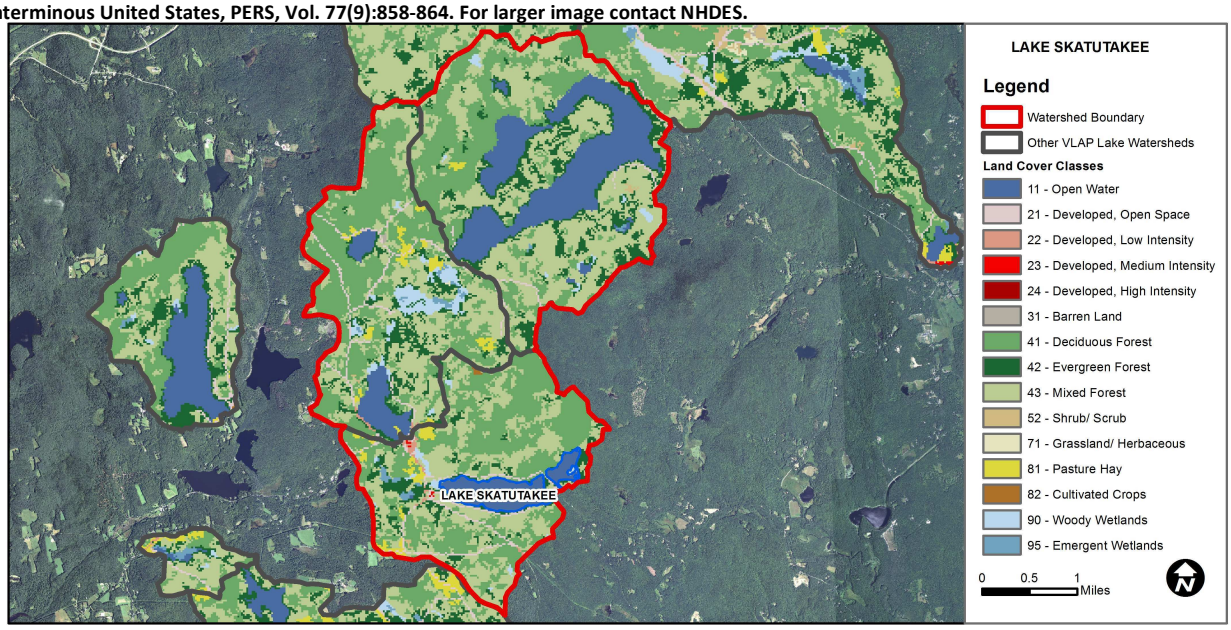
**KNOWN EXOTIC SPECIES**

**The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm**

| Designated Use | Parameter | Category | Comments |
|---|---|---|---|
| Aquatic Life | Phosphorus (Total) | Good | The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay. |
| | pH | Slightly Bad | >10% of samples exceed criteria by a small margin (minimum of 2 exceedances). |
| | Oxygen, Dissolved | Encouraging | There are < 10 samples with 0 exceedances of criteria. More data needed. |
| | Dissolved oxygen satura | Good | There are at least 10 samples with one, but < 10% of samples, exceeding criteria. |
| | Chlorophyll-a | Good | The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator. |
| Primary Contact Recreation | Escherichia coli | Encouraging | There are no geometric means or there are > 2 single samples but those samples are within 75% of the geometric means criteria. More data needed. |
| | Chlorophyll-a | Good | There are at least 10 samples with one, but < 10% of samples, exceeding indicator. |

**WATERSHED LAND USE SUMMARY**

**Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.**




| Land Cover Category | % Cover | Land Cover Category | % Cover | Land Cover Category | % Cover |
|---|---|---|---|---|---|
| Open Water | 14.2 | Barren Land | 0.03 | Grassland/Herbaceous | 0.01 |
| Developed-Open Space | 2.17 | Deciduous Forest | 33.73 | Pasture Hay | 1.57 |
| Developed-Low Intensity | 0.31 | Evergreen Forest | 10.55 | Cultivated Crops | 0.04 |
| Developed-Medium Intensity | 0.03 | Mixed Forest | 34.67 | Woody Wetlands | 2 |
| Developed-High Intensity | 0 | Shrub-Scrub | 0.09 | Emergent Wetlands | 0.44 |

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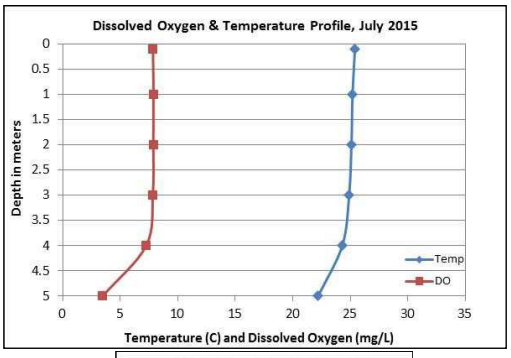
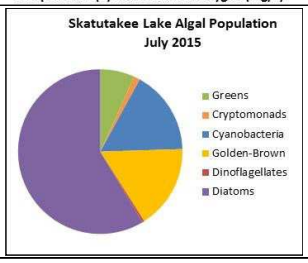
## Skatutakee Lake, Harrisville
## 2015 Data Summary

- **Recommended Actions:** Algal growth has become increasingly variable in recent years despite the decreasing phosphorus trend. Tributary phosphorus levels are also low. It is possible that boat action in shallow areas of the lake is disturbing bottom sediments and releasing phosphorus into the water column making it available for algal growth. The DES fact sheet WD-WMB-25 "Impacts of Motorized Craft on New Hampshire's Waterbodies" is a good resource. The increased frequency and intensity of storm events also may be transporting sediments and phosphorus to the lake. It is important to manage stormwater runoff from dirt/gravel roads, steep slopes, agricultural areas, and shoreline properties to try and minimize nutrient pollution from stormwater runoff. DES' "NH Homeowner's Guide to Stormwater Management" is a great resource. Keep up the great work!

**Observations** (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels were slightly elevated in June and greater than the state median. Chlorophyll levels decreased in July however field duplicate data did not meet acceptance criteria and the data were invalidated and not used for reporting purposes. Chlorophyll levels decreased slightly from 2014 and historical trend analysis indicates stable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Deep spot, Goose Brook and Outlet conductivity levels were average and approximately equal to the state median. Epilimnetic (upper water layer) chloride was slightly greater than the state median but much less than state chloride standards. Historical trend analysis indicates highly variable epilimnetic conductivity since monitoring began. Spring Brook conductivity and chloride levels continue to be slightly greater than the state medians indicating potential impacts from winter de-icing materials.
- **E. coli:** Goose Brook and Spring Brook E. coli levels were very low on each sampling event and much less than state standards for public beaches (88 cts/100 mL) and surface waters (406 cts/100 mL).
- **Total Phosphorus:** Epilimnetic and Hypolimnetic (lower water layer) phosphorus levels were higher in June and likely contributed to the algal growth. Phosphorus decreased gradually to low levels by September. Average epilimnetic phosphorus decreased from 2014 and was less than the state median. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus since monitoring began and we hope to see this continue! Goose Brook and Outlet phosphorus levels remained low. Spring Brook phosphorus levels were slightly elevated in June and the turbidity was also slightly elevated following a significant storm event.
- **Transparency:** Transparency measured without the viewscope (NVS) increased (improved) from June to September and average NVS transparency remained stable with 2014 but was less than the state median. Historical trend analysis indicates relatively stable NVS transparency with moderate variability between years. Transparency measured with the viewscope was better than NVS, increased (improved) as the summer progressed, and was greater than (better than) the state median and likely a better representation of actual conditions.
- **Turbidity:** Epilimnetic, Hypolimnetic, Goose Brook, and Outlet turbidities were slightly elevated in July and September potentially due to dry weather and low flow conditions. Spring Brook turbidity was elevated in June following a significant storm event and a small amount of organic matter was noted in the sample.
- **pH:** Epilimnetic pH fluctuated below the desirable range 6.5-8.0 units in June and July and historical trend analysis indicates highly variable epilimnetic pH since monitoring began. Hypolimnetic, Goose Brook and Outlet pH levels were less than desirable. Spring Brook pH levels remained within the desirable range on each sampling event.




**NH Water Quality Standards:** Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
**Chloride:** > 230 mg/L (chronic)
**E. coli:** > 88 cts/100 mL – public beach
**E. coli:** > 406 cts/100 mL – surface waters
**Turbidity:** > 10 NTU above natural level
**pH:** between 6.5-8.0 (unless naturally occurring)

**NH Median Values:** Median values for specific parameters generated from historic lake monitoring data.
**Alkalinity:** 4.9 mg/L
**Chlorophyll-a:** 4.58 mg/m$^3$
**Conductivity:** 40.0 uS/cm
**Chloride:** 4 mg/L
**Total Phosphorus:** 12 ug/L
**Transparency:** 3.2 m
**pH:** 6.6

| Station Name | Table 1. 2015 Average Water Quality Data for SKATUTAKEE LAKE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Alk. mg/l | Chlor-a ug/l | Chloride mg/l | Cond. uS/cm | E. Coli #/100ml | Total P ug/l | Trans. m | | Turb. ntu | pH |
| | | | | | | | NVS | VS | | |
| Epilimnion | 3.4 | 5.43 | 9 | 44.3 | | 8 | 2.88 | 3.30 | 1.47 | 6.46 |
| Hypolimnion | | | | 45.0 | | 13 | | | 2.40 | 6.22 |
| Goose Brook | | | | 44.1 | 10 | 8 | | | 1.39 | 6.27 |
| Outlet | | | | 42.8 | | 8 | | | 1.50 | 6.44 |
| Spring Brook | | | 20 | 110.1 | 10 | 11 | | | 1.55 | 6.63 |

### Historical Water Quality Trend Analysis

| Parameter | Trend | Explanation | Parameter | Trend | Explanation |
|---|---|---|---|---|---|
| Conductivity | Stable | Trend not significant; data highly variable. | Chlorophyll-a | Stable | Trend not significant; data show low variability. |
| pH (epilimnion) | Stable | Trend not significant; data highly variable. | Transparency | Stable | Trend not significant; data moderately variable. |
| | | | Phosphorus (epilimnion) | Improving | Data significantly decreasing. |